A Dissertation on

ANTERIOR ABDOMINAL WALL HERNIA IN WOMEN

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CERTIFICATE

Thisd is to certify that this dissertation in "**ANTERIOR ABDOMINAL WALL HERNIA IN WOMEN"** is a work done by **Dr.Malarvizhi Chandrasekaran** under my guidance during the period 2004-2007. This has been submitted in partial fulfillment of the award of MS Degree in General Surgery (Branch-I) by the Tamil Nadu Dr.M.G.R. Medical University, Chennai - 600 032.

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CONTENTS

INTRODUCTION

Hernia is a protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity. The external Abdominal Hernia is the commonest form. The most frequent types are Inguinal, Femoral, Umblical, Paraumblical, Epigastric and Incisional Hernia.

Although Hernia is more common in men , women are also is susceptible to hernia. There is very little published information relating specifically to hernia in women. The following discussion aims to shed light on the different types of hernia in women ,mode of presentation,treatment options and outcome.

AIMS OF STUDY

1. To determine the incidence of various types of hernia in women and the most common hernia occurring in women.

2. To find the common Predisposing factors for hernia in women and determine prevention strategies.

3. To determine the Age Distribution of Hernia in Women.

4. To decide on the Best form of Treatment.

5. To find out the Morbidity and Mortality of Hernia surgery in women.

MATERIAL AND METHODS

This is a retrospective study of Inpatients in the department of Surgery at KMCH Chennai during the period April 2003 to May 2006.

The inpatients chosen in this study were all adult women above 15 years. They presented with various types of external Abdominal Hernia. Patients admitted for both Elective and Emergency surgery were included in this study.

PROFORMA

Name :

Age :

Sex :

IP Number :

PRESENTING COMPLAINTS

1. Pain
2. Lump in the Abdomen
3. Intestinal Obstruction
4. Irreduciblity of the Lump

HISTORY OF PRESENTING COMPLAINTS

PAST HISTORY

1. Comorbid illness.
2. Nature of Previous surgery.

PERSONAL HISTORY

MENSTRUAL HISTORY

OBSTETRIC HISTORY

FAMILY HISTORY

TREATMENT HISTORY

HISTORY OF DRUG ALLERGY

GENERAL EXAMINATION

Height

Weight

Body Mass Index

Build

VITAL SIGNS

1. Temperature
2. Pulse Rate
3. Blood Pressure
4. Respiratory Rate

LOCAL EXAMINATION

IN STANDING AND SUPINE POSITION

INSPECTION

Site of Pain or Lump.

Characteristics of the Lump

PALPATION

PERCUSSION

AUSCULTATION

SYSTEMIC EXAMINATION

RESPIRATORY SYSTEM

CARDIOVASCULAR SYSTEM

NERVOUS SYSTEM

SPINES

CRANIUM

INVESTIGATIONS

HAEMOGRAM

URINE ROUTINE ANALYSIS

BLOOD UREA

BLOOD SUGAR

SERUM CREATININE

SERUM ELECTROLYTES

CHEST X RAY

ABDOMEN X RAY

ECG

ULTRA SOUND ABDOMEN

DIAGNOSIS

SURGERY

OUTCOME

REVIEW OF LITERATURE

Hernia is the most common condition encountered by a general surgeon both in elective and emergency situations.

As Sir, Astley Paston Cooper aptly states “No disease of the human body belonging to the province of the surgeon, requires in its treatment a better combination of accurate anatomical knowledge with surgical skill than hernia in all its varieties.

The most frequent varieties of hernias in a general surgical practice are Inguinal, Umbilical, Paraumbilical, Incisional and femoral hernias. Other rare forms of hernias are Spigelian, Obturator, Lumbar Interstitial and Perenial hernias. Among these, the anterior abdominal wall hernias are epigastric, umbilical, incisional, inguinal and femoral hernias.

Although the repair of abdominal hernia is the commonest surgery performed by a general surgeon, little attention has been paid to the demographic, classification and socio economic aspects of hernia surgery. Unfortunately no reliable studies have been published concerning the incidence or prevalence of abdominal wall hernia. Incidence of hernia is unknown but it is estimated that 5% of the population develop an abdominal hernia. Of this 75% occur in groin region. 5% of groin hernias are femoral hernia, the rest are inguinal hernia. Incisional hernia accounts for 15 to 20% of all hernias. Umbilical and epigastric hernia constitute 10% of hernias.

These figures represent hernia occurring in the general population. Precise information regarding hernia in women are not available.

The National Hospital Discharge Surgery (NHDS) has compiled data on the number of the hernia surgeries performed annually in the United States. Analysis of this data reveals the following trends.

Greater than 90% of all inguinal hernias are performed on males. Females have 3 times as many femoral hernioraphies as males. However females in total undergo 3 times as many inguinal hernioraophies. All other abdominal wall hernia s including umbilical, epigastric and incisional are done in a ratio of 65% female to 35% male.

Individuals 45- 65 years undergo more inguinal hernia repairs than other age groups.

All other abdominal wall hernia repair are performed most frequently in the 45-65 age group

Certain features are common to all hernias namely, etiology, composition and classification.

Causes of abdominal wall hernia

1. An anatomical weakness

a. Structures passing through the abdominal wall (Inguinal)

b. Muscles fail to overlap

c. No musculature. Only scar tissue. (Umbilical)

2. An acquired weakness following trauma.

a. Surgical

b. Non-surgical

3. A high intra abdominal pressure

a. Coughing

b. Straining

c. Abdominal distension due to ascites, pregnancy etc.

Composition of a hernia

As a rule, a hernia consists of three parts - the sac, the coverings of the sac and the contents of the sac.

The sac

The sac is a diverticulum of peritoneum, consisting of mouth, neck, body and fundus. The neck is usually well defined, but in some direct inguinal hernias and in many incisional hernia there is no actual neck. The diameter of the neck is important because strangulation of bowel is a likely complication where the neck is narrow as in femoral and paraumbilical hernias.

The body of the sac varies greatly in size and is not necessarily occupied. In cases occurring in infancy and childhood, the sac is gossamer thin. In long-standing cases, the wall of the sac may be comparatively thick.

The covering

Coverings are derived from the layers of the abdominal wall through which the sac passes. In long-standing cases, they become atrophied from stretching and so amalgamated that they are indistinguishable from each other.

Contents

These can be

1. Omentum = omentocele (synonym : epiplocele)
2. Intestine = enterocele. More commonly small bowel, but may be large intestine or appendix.
3. A portion of the circumference of the intestine = Richter's hernia.
4. A portion of the bladder (or a diverticulum) may constitute part of or be the sole contents of a direct inguinal, a sliding inguinal or a femoral hernia.
5. Ovary with or without the corresponding Fallopian tube.
6. A Meckel's diverticulum = a Littre's hernia
7. Fluid. As part of ascites or as a residuum thereof.

Classification

Irrespective of site, a hernia can be classified into five types.

Type of hernias

- Reducible - contents can be returned to abdomen
- Irreducible - contents cannot be returned but there are no other complications.
- Obstructed - bowel in the hernia has good blood supply but bowel is obstructed.
- Strangulated - blood supply of bowel is obstructed
- Inflamed -contents of sac have become inflamed

An understanding of the anterior abdominal wall anatomy is essential to understand about hernias

Anatomy of the anterior abdominal wall

The anterior abdominal wall may be considered to have two parts – an anterolateral portion composed of the external oblique, internal oblique, and transverses abdominis muscles; and a midline portion composed of the rectus abdominus and pyramidalis muscles.

Anterolateral portion

The three flat muscles mentioned above are arranged so that their fibers are roughly parallel as they approach their insertion on the rectus sheath.

Midline Portion

When present, the insertion of the pyramidalis in to the linea alba is a landmark for an accurate midline incision.

The rectus muscle is enclosed in a stout sheath formed by the bilaminar aponeuroses of the abdominal muscles, which pass anteriorly and posteriorly around the muscle and attach medially to the linea alba which is formed by decussation.

In the lower ¼ of the abdominal wall, the aponeuroses of the internal oblique and transverses abdominus muscles pass anterior to the muscle, which is bounded posteriorly by the transversalis fascia only.

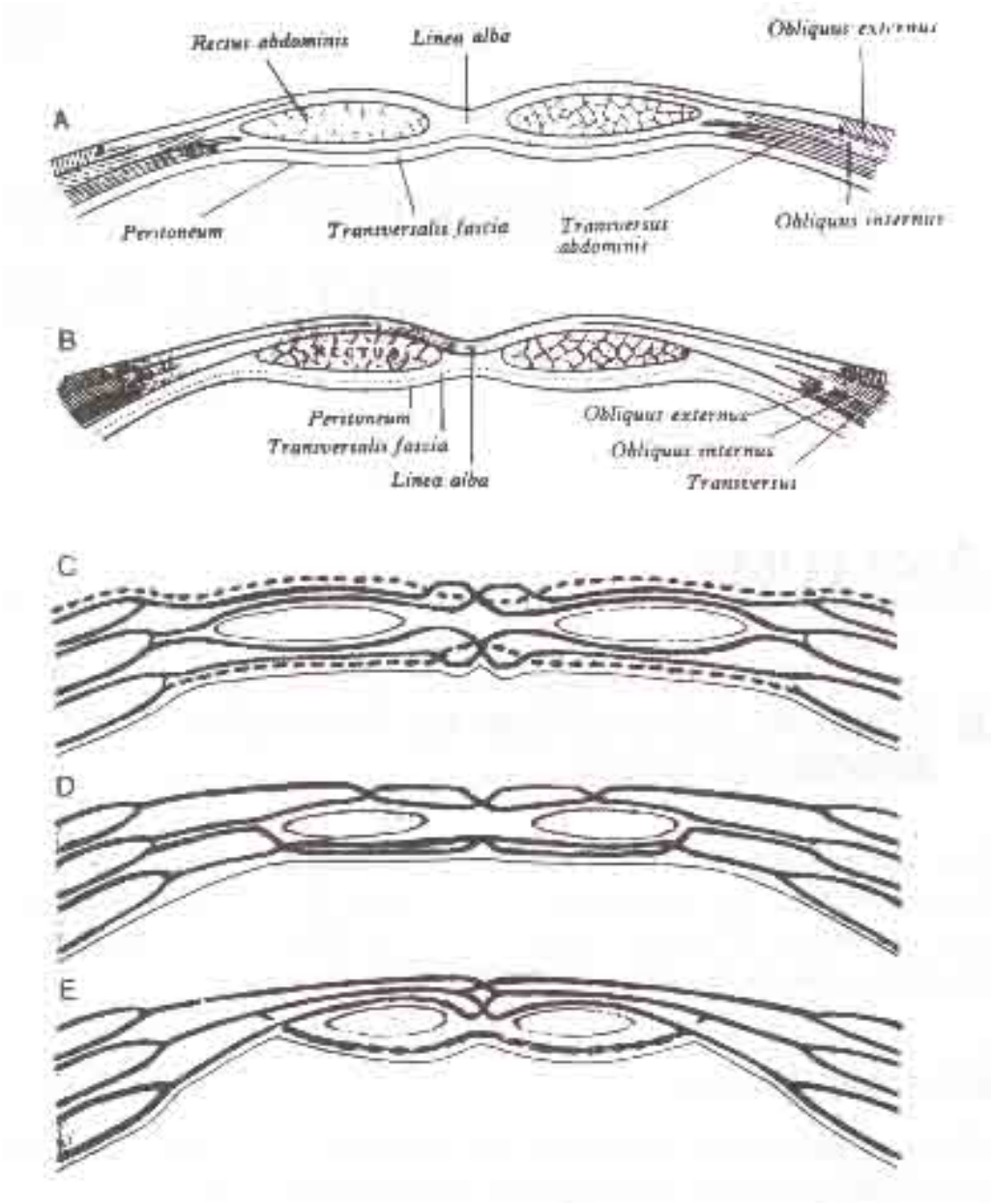
The dividing line is the linea semicircularis of Douglas, which marks the level at which the rectus sheath loses it posterior wall. The line is well marked if the change is abrupt; is it less definite if the change is gradual.

The following array shows some comparisons between the structures of the upper ¾ and the lower ¼ of the abdominal wall.

Upper Abdominal Wall	**Lower Abdominal Wall**
1. Linea alba well developed	Linea alba not well developed
2. Right and left recti well separated	Right and left recti very close together
3. External oblique fascia and aponeurosis weak or absent	External oblique fascia strong and well developed
4. Both layers of rectus sheath present	Only anterior layer of rectus sheath present

The lower abdominal wall is more prone for incisional hernias due to the above factors.

Transverse sections through the anterior abdominal wall



A. Above the umbilicus B. Below the arcuate line

C-E - Schematic transverse section through the ventral abdominal wall showing bilaminar aponeuroses, external oblique, transversus abdominis, and sites of linear decussation that, compacted, from the linea alba.

Blood supply to the anterior abdominal wall

Arterial supply

The lower anterolateral abdominal wall is supplied by the three brancjes of the femoral artery.

1. Superficial circumflex iliac artery
2. Superficial epigastric artery
3. Superficial external pudental artery

These superficial arteries travel towards the umbilicas in the subcutaneous connective tissue. The superficial epigastric artery anastomoses with the contralateral artery, and all three arteries have anastomoses with the deep arteries

The deep arteries which supply the anterior abdominal wall are

1. Posterior intercostals arteries 10 and 11
2. The anterior branch of the subcostal artery
3. The anterior branches of the four lumbar arteries and
4. The deep circumflex iliac artery

These arteries lie between the transverses abdominus and the internal oblique muscles.

The rectus sheeth is supplied by the superior epigastric artery, which arises from the internal thorasic artery, and the inferior epigastric artery, which

arises from the external iliac artery just above the inguinal ligament. The superior epigastric artery enters the upper end of the rectus sheath deept to the rectus muscle. Musculocutaneous branches pierce the anterior rectus sheath to supply the overlying skin. The perforating arteries are closer to the lateral border of the rectus than to the linea alba. The inferior epigastric artery lies first in the preperitonial connective tissue and enters the sheath at or above the level of the linea semilunaris, passing between the rectus muscle and the posterior layer of the sheath.

Venous Drainage

The veins follow the arteries.

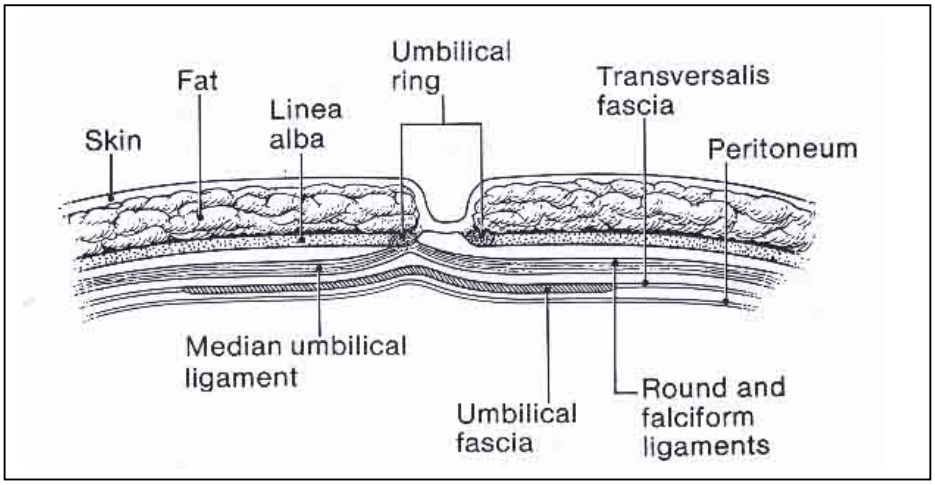
Nerve supply to the anterior abdominal wall

Both the anterolateral portion of the abdominal wall and the rectus abdominis muscle are supplied by

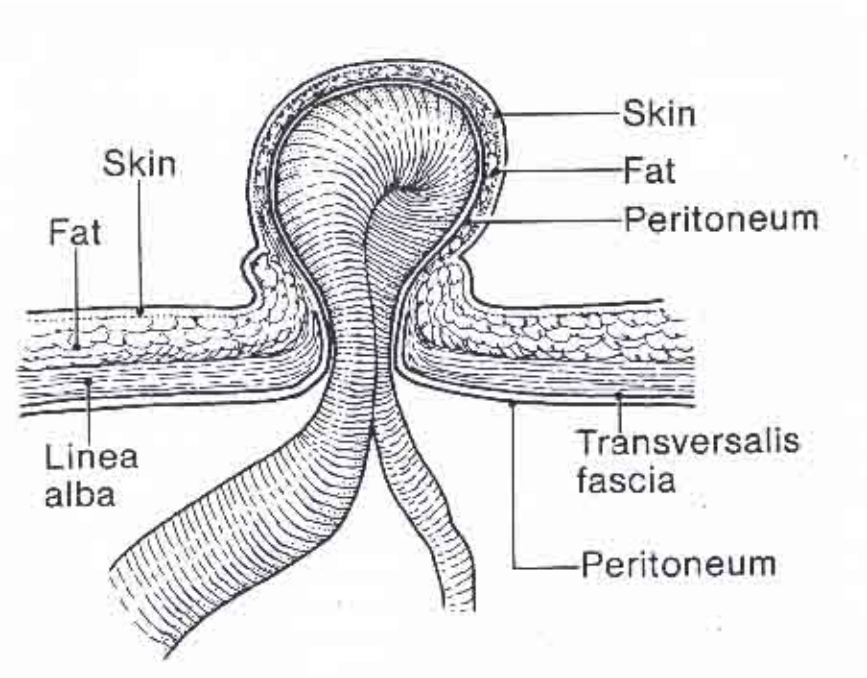
1. Anterior rami of the seventh to the twelfth thoracic nerves and
2. First lumbar nerve.

Surgical anatomy of umbilical region

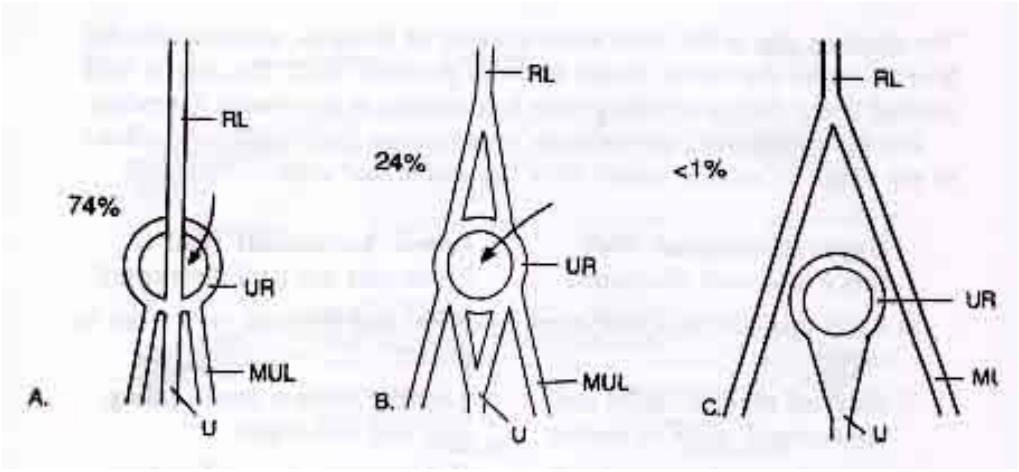
At birth the umbilical arteries and the umbilical vein become thrombosed, and the vitelline duct and the allantois have already been obliterated. The umbilical ring then scars and contracts. The obliterated umbilical vein (round ligament) is usually attached to the inferior border of the umbilical ring along with remnants of the urachus and the two obliterated umbilical arteries. The round ligament, by crossing and partially covering the umbilical ring, may protect against herniation. In instances where the ligament divides and inserts in the upper part of the umbilical ring without crossing it, a potential weakness is present. The umbilical Richet's fascia also reinforces the umbilical ring. If Richet's fascia is absent, located outside the limits of the umbilical ring, or only partially covers the ring, the area appears much weaker. Askar believes that variations in decussation of aponeurotic fibers in the midline have a role in the occurrence of umbilical and paraumbilical hernias.



Diagrammatic sagittal section through a normal umbilicus showing the relation of the umbilical ring to the linea alba, the round ligament, the median umbilical ligament (urachus), and the umbilical and transversalis fasciae.

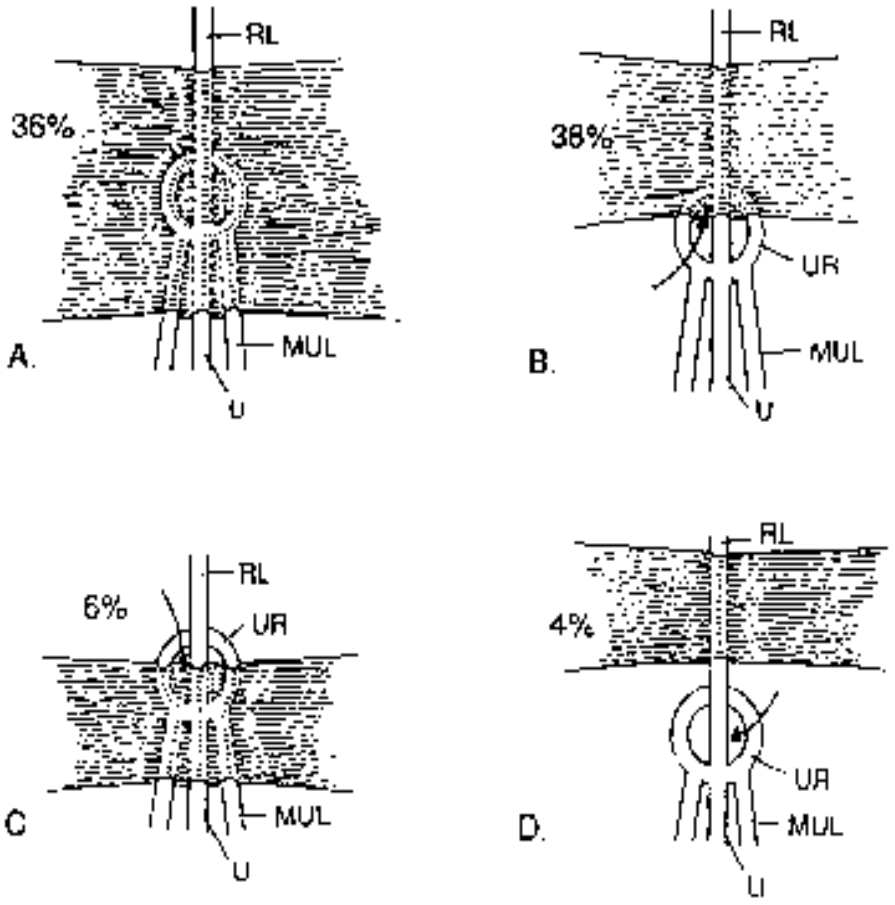


Diagrammatic sagittal section through a small umbilical hernia. The hernial sac is covered by skin only.



Variations in the disposition of the umbilical ligaments is as depicted in the above figures.
A. The round ligament (RL) crosses the umbilical ring (UR) to insert on its inferior margin. B. The round ligament splits and is attached to the superior margin of the umbilical ring. C. The round ligament branches before reaching the umbilical ring. Each branch continues with the medial umbilical ligament (MUL) without attaching to the umbilical ring.

Variations in the disposition of the umbilical fascia is as depicted in the above figures.



A. The thickened transversalis fascia forms umbilical fascia covering the umbilical ring (UR).
B. The umbilical fascia covering the superior portion of the umbilical ring
C. The umbilical fascia covering the interior portion of the umbilical ring
D. The umbilical fascia does not underlie the umbilical ring though present

Surgical anatomy of groin hernias

Within the groin area are the inguinal and femoral canals. The inguinal canal is an oblique cleft about 4 cm long in the adult, lying about 4-5 cm above the inguinal ligament. The Femoral canal below the inguinal ligament is 1.25-2 cm long and occupies the most medical compartment of the femoral sheath.

Layer of the lower anterior body wall

In the inguinal region, the layers of the abdominal wall are:

1. Skin
2. Subcutaneous or superficial fasciae (Camper's and Scarpa's) containing fat
3. Innominate fascia (of Gallauder) This is the superficial or external layer of Fascia of the external oblique muscle. It is not always recognizable. Its absence is of no surgical importance.
4. External oblique aponeurosis, includeing the inguinal (poupart's) lacunar(Gimbernat's) and reflected inguinal (Colles') liganments.
5. Spermatic cord in the male: round ligament of the uterus in the female.
6. Transversus abdominis muscle and aponeurosis, internal oblique muscle, falx inguinalis(Henle) and the conjoined tendon(when present)

7. Transversalis fascia and aponeurosis associated with the pectineal ligament (Cooper's) iliopubic tract, falx inguinalis and transversalis fascia sling

8. Preperitoneal connective tissue with fat

9. Peritoneum

10. Superficial and deep inguinal rings

Fossae of the anterior abdominal wall

The inner (posterior) surface of the anterior body wall about the inguinal ligament and below the umbilicus is divided in to three shallow fossae on either side of a low ridge formed in the midline by the median umbilical ligament, the obliterated urachus. Each of these fossae is a potential site for a hernia. From lateral to medial these fossae are:

The lateral fossa bounded medially by the inferior epigastric arteries. It contains the internal inguinal ring, the site of indirect inguinal hernia.

The medial fossa between the inferior epigastric artery and the medial umbilical ligament(remnant of the umbilical artery). It is the site of direct inguinal hernia.

The supravesical fossa, between the medial and the median umbilical ligaments. It is the site of external supravesical hernia.

Walls of the Inguinal canal

Anterior : The anterior wall is formed by the aponeurosis of the external oblique muscle with some participation of the internal oblique muscle laterally

Posterior : In about ¼ of subjects, the posterior wall is formed laterally by the aponeurosis of the transverses abdominis muscle and the transversalis fascia. In the remainder, the posterior wall is transversalis fascia only. Medially the posterior wall is reinforced by the internal oblique aponeurosis.

Superior: The roof of the canal is formed by the arched fibers of the lower edge of the internal oblique muscle and by the transverses abdominis muscle and aponeurosis.

Inferior: The wall of the canal is formed by the inguinal ligament (Poupart's) and the lacunar ligament (Gimbernat's)

The upper end of the inguinal canal is the internal or deep inguinal ring, which is a normal defect o the transversalis fascia. Its superior margin is formed by the transversus abdominis arch: its inferior margins are formed by aponeurotic fibers from the iliopubic tract, the inferior epigastric vessels , and the interfoveolar ligament(Hesselbach's) The inferior epigastric vessels penetrate the transversalis fascia.

The external or superficial inguinal ring is a triangular opening in the aponeurosis of the external oblique muscle. The superior and inferior crura, which form the margins of the ring, are held together and reinforced by intercural fibers.

Contents of the inguinal canal

Male

The spermatic cord in the male contains a matrix of connective tissue continuous with the preperitoneal connective tissue. The cord consists of

Ductus deferens

Three arteries: the interal spermatic (testicular), deferential, and external spermatic(cremasteric)

One venous plexus (pampiniform)

The genial branck of the genitofemoral nerve

The ilioinguinal nerve

Sympathetic fibers from the hypogastric plexus

Three layers of fascia, the external spermatic fascia, a continuation of the innominate fascia; the middle, cremasteric layer, continuous with the internal oblique muscle fibers and muscle fascia; and the internal spermatic fascia, an extension of the transversalis fascia.

Female

The inguinal canal includes the round ligament of the uterus, the genital branch of the genitofemoral nerve, the cremasteric vessels, the ilioinguinal nerve, and coverings as described for the male, although usually less distinct.

In females there is a rudimentary testicular analogue which descends through the muscles of the groin as in males. The equivalent of the spermatic cord is the round ligament which inside the abdomen join the uterus just as the vas deferens joins the prostrate. Hernia, in women nearly always follow the round ligament and are therefore indirect. The sac passes obliquely towards the labium, in the same way as it would pass towards the scrotum in the males.

Hydrocoele of the canal of Nuck and haematocoele of the round ligament mimic indirect inguinal hernia in females.

The femoral canal and its sheath

The femoral sheath is formed anteriorly and medially by the transversalis fascia and some transversus aponeurotic fibers, posteriorly by the pecineus and psoas fasciae, and laterally by the iliacus fascia. The sheath forms three compartments, the most medial of which is the femoral canal, through which a femoral hernia may pass. The boundaries are

Lateral: a connective tissue septum and the femoral vein

Posterior: the pectineal ligament (Cooper's)

Anterior: the iliopubic tract or the inguinal ligament or both

Medial: the aponeurotic insertion of the transversus abodiminis muscle and transversalis fascia or rarely the lacunar ligament.

INGUINAL HERNIA

An inguinal hernia is the protrusion of part of the contents of the abdomen through the inguinal region of the abdominal wall. This inguinal region is a weak part of the abdominal wall by the presence of he inguinal canal, the deep inguinal ring and superficial inguinal ring.

Inguinal Hernias are of two types

Indirect and Direct

In indirect inguinal hernia the contents of the abdomen enter the deep inguinal ring and traverse the whole length of the inguinal canal to come out through the superficial inguinal ring. This is much more common than direct inguinal hernia. This hernia usually occurs when there is a preformed sac of partially or completely patent processus vaginalis. Shortly,after birth this processus vaginalis becomes obliterated in normal individuals. Such obliteration occurs first at the deep inguinal ring, then just about the testis and finally the remaining portion between the deep inguinal ring and the upper pole of the testis is obliterated to a fibrous cord.

Indirect inguinal hernia is more commonly seen o the right side, though $1/3^{rd}$ of the cases of the hernia is or will be bilateral. Particularly, in children hernia is more common on the right side due to later descent of the right testis.

According to the extent of the hernia, it can be divided in to 3 groups

- Bubonocele – In this case the hernia is limited in the inguinal canal and the processus vaginalis is closed at the superficial inguinal ring.
- Funicular Hernia – Here, the processus vaginalis is closed just above the epididymis.
- Complete or vaginal or scrotal hernia – Here the processus vaginalis is patent throughout.

Direct Inguinal Hernia which protrudes through the posterior wall of the inguinal canal medial to the inferior epigastric vessels i.e. through Hesselbach's triangle. Direct inguinal Hernia always occurs in men. Women particularly never develop such hernia.

Males are affected 20% more commonly than females by indirect inguinal hernia

Clinical features

Patients, usually present with swelling in the groin region and discomfort and pain.

On local examination, in the standing and supine position the two classical signs of an uncomplicated hernia are Impulse on coughing and reducibility of a swelling in the groin region.

Treatment

A treatment can be Conservative or Operative.

Conservative is reserved for old patients who are unfit for surgery due to co morbid conditions.

Operative treatment consists of herniotomy in children, hernioraphy in young adults and hernioplasty in the older patients.

10% of the inguinal hernia may recur.

FEMORAL HERNIA

In this type of hernia abdominal contents pass through the femoral ring, tranverses the femoral canal and comes out through the saphenous opening. It is more common in females and accounts for 20% of cases of hernia and 5% in men and strangulation is the initial presentation of 40% of femoral hernias.

Femoral hernia is rare before puberty. Between 20 and 40 years of age, the prevalence rises and continues to old age. The right side is affected twice as often as the left and in 20% of the cases the condition is bilateral. The female patients who are affected by femoral hernia are frequently elderly and it is more prevalent in multi para than in nulliparae.

Clinical features

Femoral hernia gives rise to less complaints than inguinal hernia and may be unnoticed by the patients for years till it gets strangulated. It is usually a small globular swelling situated below and lateral to the pubic tubercle. Such a swelling is more apparent on standing and on straining. It may disappear on lying down. Only on strangulation does it produce symptoms of abdominal colic, vomiting abdominal distension and constipation.

Treatment

There is no place for conservative treatment and surgery should be performed in all cases of femoral hernia.

The reasons are mainly two : (1) there is always a risk of strangulation (II) no truss can be fitted to control femoral hernia as it becomes displaced with the flexion of the thigh

Surgery

Three types of operation are performed in case of femoral hernia and basically these operations are herniorraphy, but the approaches are different.

1. High operation of McEvedy's operation – approach is made mainly above the inguinal canal but also below it.
2. Lotheissen's operation – the approach is through the inguinal canal
3. Lockwood operation – the approach is below the inguinal ligament via as groin-crease incision

UMBILICAL HERNIA

Three types of umbilical hernia are seen in surgical practice, namely Exomphalos, umbilical hernia in infants and children and para umbilical hernia in adults.

A true umbilical hernia comes through the umbilical scar and has the umbilical skin tethered to it. It is not common in adults and are usually secondary to raised intraadbominal pressures. Common causes of acquired umbilical hernia are pregnancy and ascites.

In adults, acquired paraumblical hernia is more common.

Para umbilical hernia of adults

Women are by far the major victims and are affected 5 times more frequently than men. Patients are usually obese and above 40 years of age. Obesity, flabbiness of the abdominal muscles and repeated pregnancy are the predisposing factors.

In adults the hernia does not protrude through the umbilical cicatrix. It is a protrusion through the linea alba just above the umbilicus(supraumbilical) or occasionally below the umbilicus (infraumbilical). That is why it is called paraumbilical.

The contents of the hernia are usually greater omentum often accompanied by small intestine or by a portion of the transverse colon. In

majority of cases the sac becomes loculated due to adherance of the omentum to its fundus. That is why paraumbilical hernia is seldom reducible.

Clinical features

Pain and swelling are the main symptoms. Such pain get worse by prolonged standing and heavy exercise. Pull on the omentum gives rise to gastrointestinal symptoms. Transient attacks of intestinal colic may be present as there may be subacute intestinal obstruction.

On examination

Position – the main bulge of the hernia is mostly just above the umbilicus through the linea alba or occasionally below the umbilicus through the midline

Consistency – The lump is firm as it contains mostly omentum. On percussion it is dull. If it contains small bowel, it may be resonant

When the contents are not adherent this hernia becomes reducible and expansile cough impulse becomes also evident but unfortunately in many hernia the contents are adherent so the hernia become irreducible and impulse on coughing is absent.

Treatment

Operation is the treatment of choice, since the hernia may eventually strangulate. However if the hernia is asymptomatic the surgery can be postponed till the patients weight has been reduced. Mayo’s operation is usually practiced.

EPI GASTRIC HERNIA

When a hernia protrudes in th emidline through the interlacing fibres of the linea alba anywhere between umbilicus and xiphisternum, it is called an epigastric hernia. Majority of cases occur midway between umbilicus and xiphisternum. It occurs through the same opening where the linea alba is pierced by small blood vessel. Such type of hernia begins as a protrusion of extraperitoneal fat and that is why it is also called fatty hernia of the linea Alba.

As the hernia grows bigger, it drags a pouch of peritoneum after it and it becomes a true epigastric hernia. The mouth of the hernial sac is usually quite narrow and it does not permit any viscus to enter the hernial sac, only a small portion of greater omentum may enter it.

Aetiology

It seems that sudden strain helps to bring out such hernia. Such strain will lead to tearing of the interlacing fibres of the linea alba. That is why this hernia is mostly restricted to young muscular men majority of whom are manual workers.

Clinical features

Epigastric hernia usually presents itself in one of the three clinical types

(i) Symptomless – Epigastric hernia is often symptomless and may be discovered by the patient only as a swelling during washing his own body.

(ii) Painful swelling – sometimes patient with epigastric hernia complains of a localized pain exactly at the site of the hernia. Pain often gets worse on physical exertion. Occasionally, the fatty content may be pressed upon by the tight margins of the gap in the linea alba to produce partial strangulation. In these cases the swelling will be tender and patients will feel pain on wearing tight clothings.

(iii) Referred dyspepsia – patients with epigastric hernia may give symptoms which mimic peptic ulcer though there is actually no such ulcer. Patient might not have noticed the swelling even. Peptic ulcer may be present in cases of epigastric hernia and such ulcer must be excluded. Patient may complain of pain after eating possibly due to epigastric distension. Such dyspepsia may also be due to epigastic hernia.

Physical examination

Epigastric hernia feels firm and does not usually have a cough impulse and cannot be reduced. For this, it becomes difficult to distinguish epigastric hernia from lipoma. Only occasionally when a sac is present, expansile impulse and reducibility may be noticed.

Treatment Operation is only justified if the hernia is give rise to symptoms

Operation

A long midline vertical or transverse incision is made over the swelling. The incision must be adequate as the gap in the linea alba must be viewed properly. The incision is deepened till the fatty protrusion of hernia is detected

The protruding extraperitoneal fat is dissected clear from the hernial oriface by gauze dissection. The pedicle is ligated and the fat distal to the ligation is excised. The gap in the linea alba is reapired with non absorbable suture.

If a small peritoneal sac is present, it is opened to see if there is any content or not. If a small portion of omentum is the content, it is dragged out and examined to exclude partial strangulation. If partial strangulation is there the portion of omentum is excised after ligation. If the portion of omentum is healthy it is pushed back in to the peritoneal cavity. The sac is ligated and excised. The gap in the linea alba is repaired with non absorbable suture.

If the gap in the linea alba is big, it should be repaired by overlapping transversally (as Mayo’s operation) or longitudinally. Skin is closed as usual.

INCISIONAL HERNIA

Definition

Incisional hernia is the abnormal protrusion of peritoneum through a separation of the edges of a musculoaponeurotic wound caused by a previous surgical operations or an accidental trauma. The wound may be fresh, recent or even old. The peritoneal sac may or may not contain a viscus.

Predisposing pathogenic factors

1. Obesity (the most important single factor)
2. Wound infection
3. Wound dehiscenfe
4. Postoperative hematoma or seroma
5. Type of incision
6. Poor technique of wound closure
7. Inadequate available abdominal wall (resulting from surgery or trauma)
8. Postoperative distension
9. Ascites secondary to liver cirrhosis
10. Concomitant steroid therapy
11. Malnutrition (hypoproteinemia scurvy)
12. Pulmonary complications

Pathology

(a) Often the incisional hernia starts unnoticed and symptomless with partial disruption of the deeper layers of a laparotomy wound during very early postoperative period. So careful closure of the wound is extremely important to prevent incisional hernia. There may be some oozing of serosanguineous discharge through the laparotomy wound, but this is more of a signal of wound dehiscence of burst abdomen rather than of incisional hernia.

(b) Wound infection often causes disruption of sutures thus the muscles are separated by weak scar tissue. A portion of the muscles may also be destroyed by infection, which are resolved afterwards by fibrosis. This also causes weak scar. Through this weak scar incisional hernia occurs.

Clinical features

History

A previous operation or a trauma is often noticed. Patient may give a history of wound infection.

Age - Incisional hernia may occur at any age, but more common in fatty elderly females.

Symptoms

The commonest symptoms are the swelling and the pain. Sometimes attacks of sub acute intestinal obstruction may occur leading to abdominal colic, vomiting, constipation and distention of the abdomen. Strangulation though uncommon is liable to occur at the neck of a small sac or in a locule of a large hernia.

On Examination

The old scar is seen with the swelling. The hernia may occur through a small portion of the scar, often the lower end. Often a diffuse bulge may occur involving the whole of the scar. Usually the swelling is reducible and an expansile cough impulse is present. The defect in the abdominal wall is otten palpable.

It may also happen that the hernia is irreducible. Such cases become difficult to diagnose. These cases must be differentiated with (differential diagnosis)

(i) A deposit of tumour

(ii) An old abscess

(iii) A haematoma

(iv) A foreign body granuloma

Types of incisional hernia

Two distinct types of incisional hernia should be recognized, as the priniciples of treatment are different in these two cases.

1. In Type I, this hernia is situated in the upper abdomen or in the midline of the lower abdomen . There is a wide gap in the musculature which is easily recognized and whose margin is smooth and regular. This hernia reduces spontaneously as soon as the patient lies down. So mostly it is a reducible hernia. This type of hernia takes the form of a diffuse bulge. Risk of strangulation is almost negligible. These herniae can be treated by simple abdominal corsets.

2. In Type II, this hernia is situated in the lateral part of the abdomen. The defect in the musculature is relatively small and irregular. The contents are normally both bowel and omentum. These are usually matted together and are adherent to loculated peritoneal sac. There are usually multiple loculi. So this hernia is partially or wholly irreducible. As the muscular defect is small, risk of strangulation is high.

Treatment

1. Preventive Treatment

Few preoperative measures should be carefully adopted to lessen the chance of incisional hernia. These are

(a) If the patient is obese, weight should be reduced by dieting if an elective operation has to be performed.

(b) If the patient has a tendency of chronic bronchitis, it should be treated first

(c) During operation one must be very careful in closure of the abdomen. Deeper layers must be sutured with due respect.

(d) All precautions should be adopted to prevent immediate postoperative wound infection.

2. **Conservative Treatment**

There is hardly any scope for conservative treatment in cases of incisional hernia. Conservative method may be only tried in type I cases if they are reducible. This method cannot be adopted if the hernia is irreducible. After reducing the hernia a belt is fitted with a suitable pad so that the hernia does not get an opportunity to come out. If such treatment is continued for a long time without giving a chance of hernia to come out, there is a possibility of cure. Moreover this treatment may be applied to those types I cases where operation is contraindicated due to the general condition of the patient.

Surgical treatment

Three techniques can be used for hernia repair

Simple and complex appositin and plastic fibre mesh or net closures

Simple apposition

The hernial sac is dissected. It is then formally, if not already inadvertently opened and the contents are reduced. Adherent omentum and bowel have to be freed by dissection before the mouth of the sac can be defined. The layers are repaired usually with non – absorbable suture; first the peritoneum, then the facial (aponeurotic) layers. The lateral edges of the fascia are freed from the overlying muscles for some distance and this fascial layer is approximated with interrupted sutures at the upper and lower ends of the wound. The muscles and the remaining fascial layer are approximated. Tension relaxing incisions may be required and should be placed well laterally.

Complex apposition

These consist of various types of layered closures(Mayo, Keel, da silva) and should be considered obsolete and of historical interest only.

Plastic fibre mesh or net closures

These techniques are now the method of choice for all but for the smallest defects (< 4 cm) . The sac is dealt with as above. The layers of the fascia are dissected out and , if above the umbilicus the posterior rectus sheath edges apposed. A sheet of polyprophlene mesh is then inserted between the posterior rectus sheath and the muscle fibres and anchored in place. If below the umbilicus, the mesh is placed in the preperitoneal space. The anterior rectus sheath is then apposed as above. If the defect is too large to close by apposition of the rectus sheath, the deficiency in the abdominal wall can be

bridged by sewing the mesh to the fascia on either side of the defect, ensuring at least a 4 cm overlap of the fascial edges. Some incisional hernias are now being repaired by the laparoscopic placement of the mesh.

Careful haemostasis and meticulous asepsis are essential during these operations. Post operative collections of serum can be removed by drainage using plastic tubing that leads, via skin punctures lateral to the wound in to closed suction drainage bottles (eg Redi – vac)

Post operative Care

Gastric decompression and intravenous fluids are employed and nothing by mouth allowed until the bowels have functioned. Early ambulation and gentle physical exercise is to be encouraged. The patient should not resume strenuous exercise for several weeks.

Results of treatment

Most series report recurrence of the hernia in between 30% and 50% of patients, except where mesh inlay techniques have been employed in specialist centers, in which case recurrence rates may be as low as 10%.

OBSERVATION AND RESULTS

164 Female patients presenting with anterior abdominal wall hernia in the general surgery department of Kilpauk in the period between 2004 – 2006 were studied. They were followed up for a minimum period of 3 months and a maximum of 2 years.

TYPES OF HERNIA

Types of hernia	No of patients	%
Incisional hernia	121	73.8%
Umbilical hernia	2	1.2%
Para umbilical Hernia	20	12.2%
Epigastric hernia	14	8.5%
Inguinal hernia	4	2.4%
Femoral hernia	3	1.8%
Total	164	100%

The most common hernia was incisional hernia

Types of repair	Total no of patients	%
Elective	148	90.2%
Emergency	16	9.8%

AGE CHARACTERISTICS

Types of hernia	Below 15 yrs	15 to 44 years	45 to 64 years	Above 65 years
Incisional hernia	-	70.2%	26.4%	3.3%
Umbilical hernia	-	27.3%	63.6%	9.1%
Epigastric hernia	-	50.0%	50.0%	-
Inguinal hernia	-	50.0%	-	50.0%
Femoral hernia	-	33.3%	66.7%	-

Hernia most commonly affects Women in the Reproductive age group.

RISK FACTORS

Risk factors for developing hernia	No of patients	%
Obesity	152	92.6%
Wound sepsis	20	12.1%
Chronic cough	12	7.3%
Abdominal distension	7	4.2%

Obesity was the most common risk factor for developing external abdominal herinia.

ANAESTHESIA

Types of Anaesthesia	No of patients	%
Spinal	162	98.8%
Epidural	-	-
General	2	1.2%
Local	-	

Most of the patients underwent surgery under spinal anaesthesia which was found to be safe.

POST OPERATIVE COMPLICATIONS

Complications	No of patients	%
Uneventful	129	78.8%
Wound infection and gaping	25	15.2%
Scroma	7	4.2%
Recurrence	2	1.2%
Death	1	0.6%

In this series the Morbidity was 20.6% and Mortality 0.6%

NATURE OF PREVIOUS SURGERY

Incisional Hernia following	No of patients	%
Emergency Caesarian section	76	62.8%
Elective Caesarian section	14	11.5%
Hystrectomy	15	12.3%
Sterilization	16	13.2%

Emergency Caesarian section was the commonest surgery leading to incisional hernia in women.

TIME OF APPEARANCE OF SYMPTOMS

Time	No of patients	%
6 months to 1 year	82	67.7%
1 year to 5 years	31	25.6%
5 years to 10 years	8	6.6%

Most of the patients developed symptoms of incisional hernia within the first year following the previous surgery.

HERNIA REPAIR TECHNIQUES

Procedure	Total no of patients	%
Mesh repair	38	23.0%
Anatomical repair	99	60.3%
Mayo’s repair	20	12.1%
Mc Evedy’s repair	3	1.8%
Modified Bassini’s repair	4	2.4%

UMBILICAL HERNIA

FEMORAL HERNIA

INGUINAL HERNIA

INCISIONAL HERNIA

INCISIONAL HERNIA WITH BURST ABDOMEN

DISCUSSION

My thesis is a retrospective study of women with anterior abdominal hernia. They presented to the surgical outpatient department at Kilpauk Medical College & Hospital between April 2004 – May 2006.

The women belonged to the lower socioeconomic strata. They were in the age group between 20 years & 80 years. Their follow up varied from 3 months to 2 years.

The study group comprised of 164 cases. Among them, the majority ie 90% of the women presented to the regular outpatient department underwent elective hernia repair. 10% of the women however presented to the hospital in the emergency ward and underwent emergency hernia repair.

Types of hernia

73.8% of these women presented with incisional hernias.

12% had paraumbilical hernia

8.5% had epigastric hernia

2.4% had inguinal hernia and

1.8% had femoral hernia

Incisional hernia was the most common hernia in this study followed by Para umbilical hernia.

Whereas according to the literature in the general population groin hernias were the commonest followed by incisional hernia .

In our series on women, groin hernias were the least common and incisional hernias were the most common followed by paraumbilical hernias.

Incisional hernia

Incisional hernia was the commonest types of external hernia in women. Women with the hernia presented to the outpatient department complaints of lump abdomen in a previous surgical scar.

74% of incisional hernia followed Caesarian section and 62.8% occurred following emergency LSCS with 11.5% of incisional hernia occurred after elective LSCS.

The next common cause was following puerperal sterilization comprising 13.2% and another 12.3% followed hysterectomy.

67.7% of incisional hernia occurred in the first year of surgery.

25% occured with in 5 years and only 6% occurred after 5 years.

So most of the incisional hernia occurs in the early postoperative period.

Obesity was the commonest predisposing factor with an incidence of 92.6% in incisional hernia patients.

Wound infection was the second most common factor.

23% of the patients underwent mesh repair and the rest were treated with anatomical repair.

Among the elective incisonal hernia repairs, the defects larger than 4 cms were closed with mesh and those less than 4 cms underwent anatomical repair. 38 cases underwent mesh repair and 86 underwent anatomical repair.

10.8% of patients with incisional hernia presented in the emergency department.

9 cases presented with features of intestinal obstruction.

2 cases presented with irreducible incisional hernia.

2 cases presented with burst abdomen. Among them one had small bowel perforation and fecal fistula. This patient had a resection anastomosis of the small bowel. She had a stormy post operative period and died due to sepsis.

The most common presentation was intestinal obstruction with irreducibility. All of them underwent anatomical repair.

The sac contents were

- Small bowel
- Omentum
- Transverse colon

And there were adhesions between the contents and the sac, which was released, and the contents were reduced in to the abdominal cavity.

70.2% of the women belonged to the reproductive age group 15 to 44 years.

Para Umbilical Hernia

Para Umbilical Hernia was the second most common hernia in this study group. 14.3% was the incidence with 1.2% of true umbilical hernias and 12.1% of para umbilical hernia. 10% of the patients presented to the emergency ward with irreducible para umbilical hernias.

90% of these females were obese. 63.6% belong to the post menopausal age.

Epi gastric hernia

It is considered as a rare hernia with a incidence of 1.5% in the general population. In my study the incidence was 8.5%. They were equally distributed between the reproductive and post menopausal age group.

All hernias were single and in the midline, but in the general population 80% of the defects are single and in the midline. The rest are multiple.

Inguinal Hernia

The incidence of inguinal hernia in this study group was 2.4%. 50% were elective and 50% emergency. All of the women underwent modified Bassini's repair.

50% of the women were in the reproductive age group and the other 50% in the post menopausal age group.

Femoral Hernia

The incidence of femoral hernia in my study group was 1.8%, which was less than that of inguinal hernia. According to the literature, 11% of the groin hernias are femoral hernias, whereas in my study group it was 42.8%. This reflects that femoral hernia is common in women compared to general population.

SUMMARY

- The different types of hernia encountered in women in our study were Incisional hernia; Paraumbilical hernia, Umbilical hernia, Epigastric hernia, Inguinal hernia and Femoral hernia.

- The commonest type of hernia in women was incisional hernia following lower abdominal surgery. Since linea alba is poorly developed below the umbilicus and posterior retus sheath is deficient below linea semilunaris of Douglas, they are more prone for incisional hernia. The most common previous surgery was an emergency lower section Caesarian section.

- Common predisposing factor for incisional hernia was obesity and wound infection. The reason being fatty tissue infitrate muscle fibres causing slackening during contraction.

- Other than incisional hernia, paraumbilical hernia was the next most common hernia.

- The commonest age group affected by hernia was the reproductive age group (15-44 years). But paraumbilical hernia was more common in the postmenopausal age group. Femoral hernia was also more common in the older age group.

- The best form of treatment is mesh repair in incisional hernia, and anatomical repair in all other hernia.

- The morbidity in our series was 20.6% with wound infection being the commonest cause. The recurrence rate was 1.2% which is much less than that reported in other series. Mortality in our series was 0.6%.

- Strategies to prevent hernia in women are weight reduction, proper aseptic surgical technique, appropriate, non absorsbable suture material and tension free sutures in case of incisional hernia.

- The morbility and mortality associated with hernias can be avoided if early detection, diagnosis and appropriate treatment is instituted in cases of umblical, paraumbilical, inguinal and femoral hernia.

- Emergency surgery resulted in increased mortality.

- To conclude, hernias in women are a significant health hazard. It affects the women of reproductive age group and leads to socio economic burden to the society if not treated promptly.

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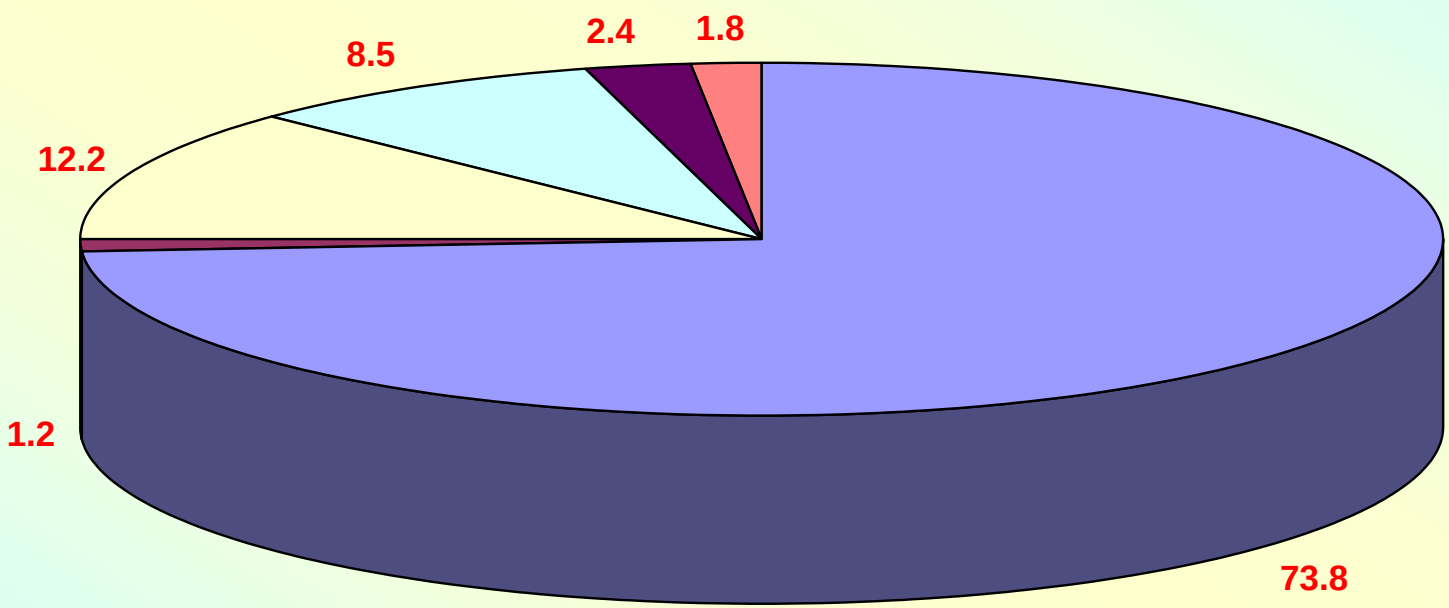
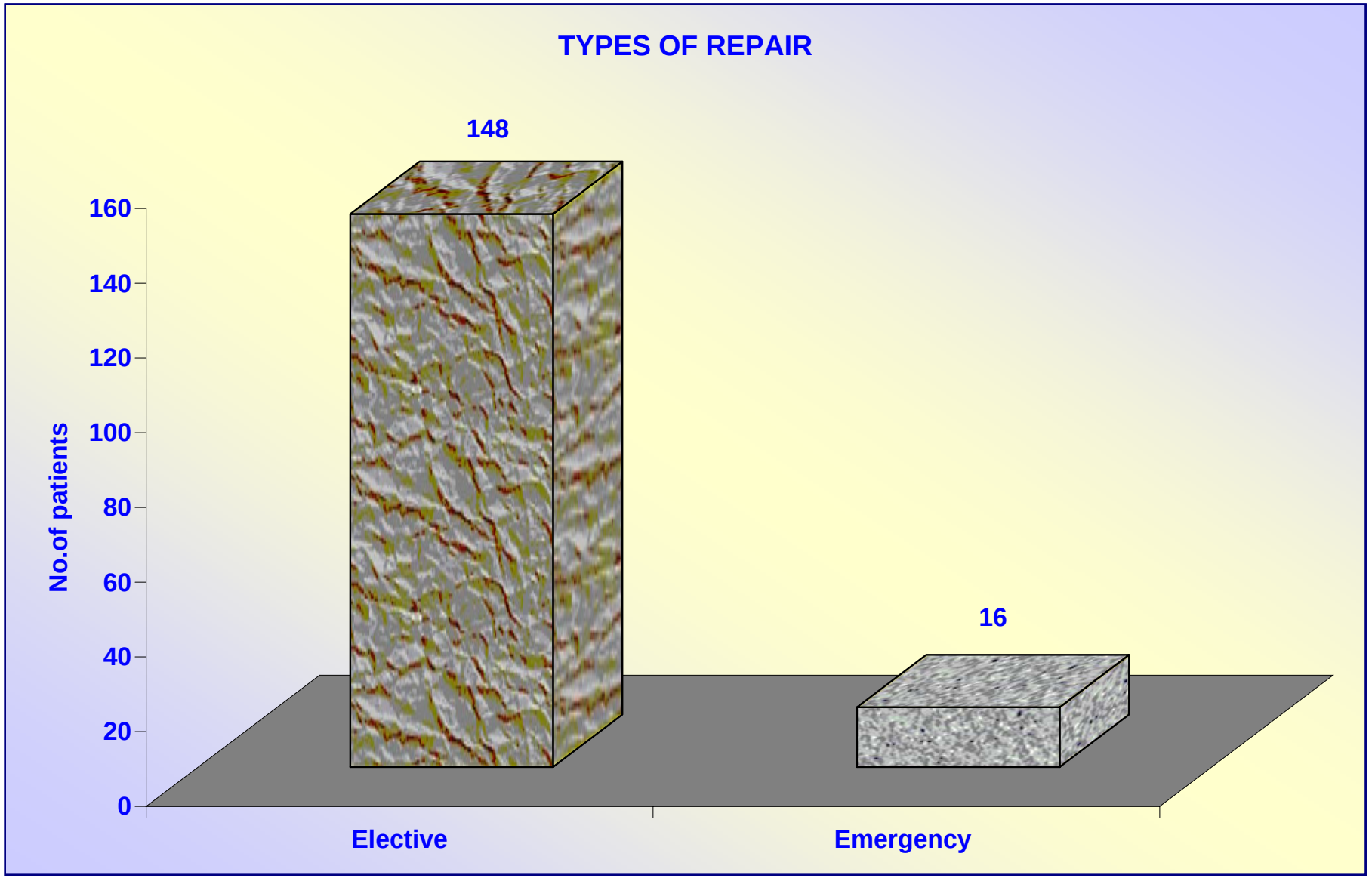
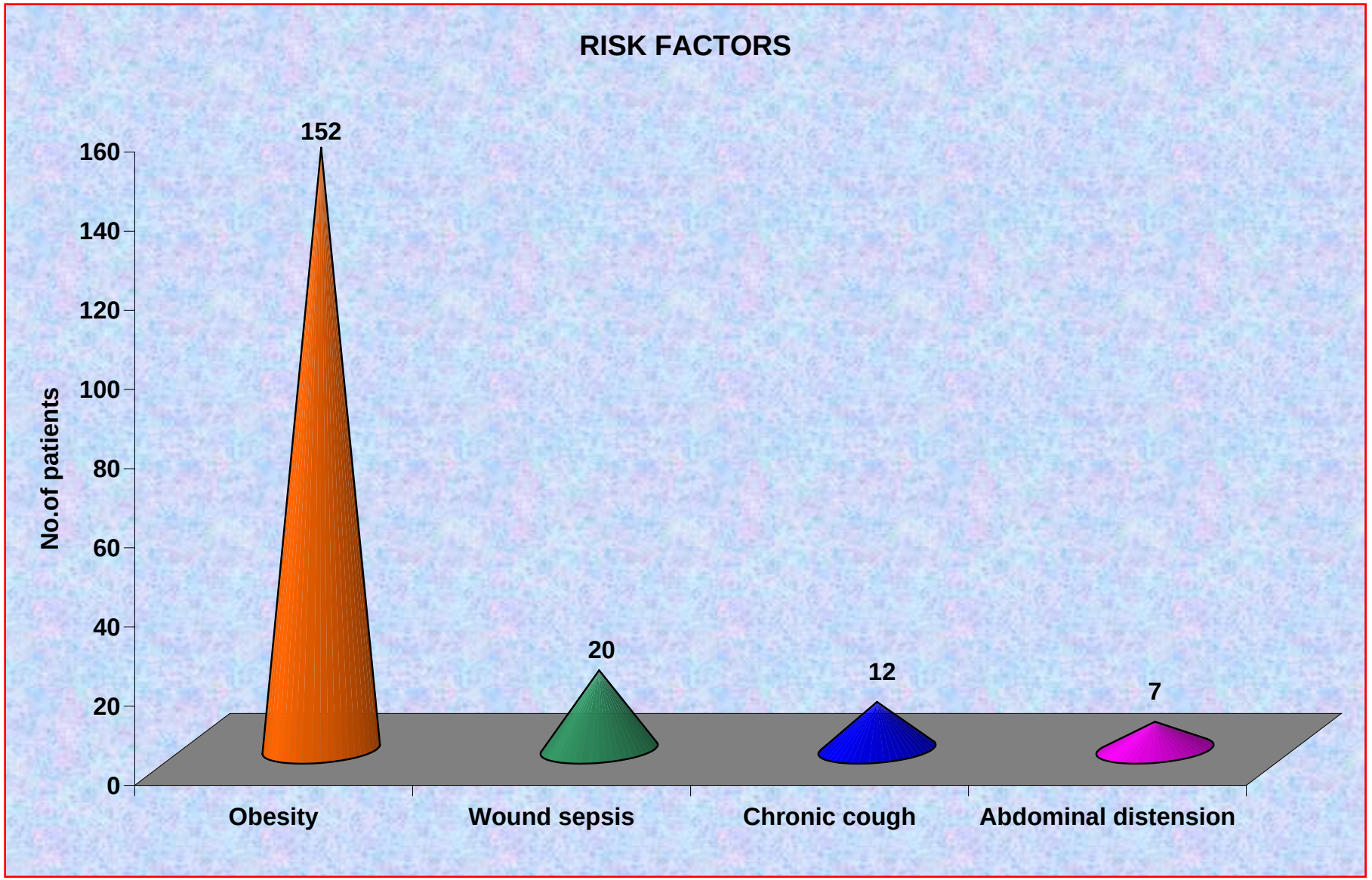
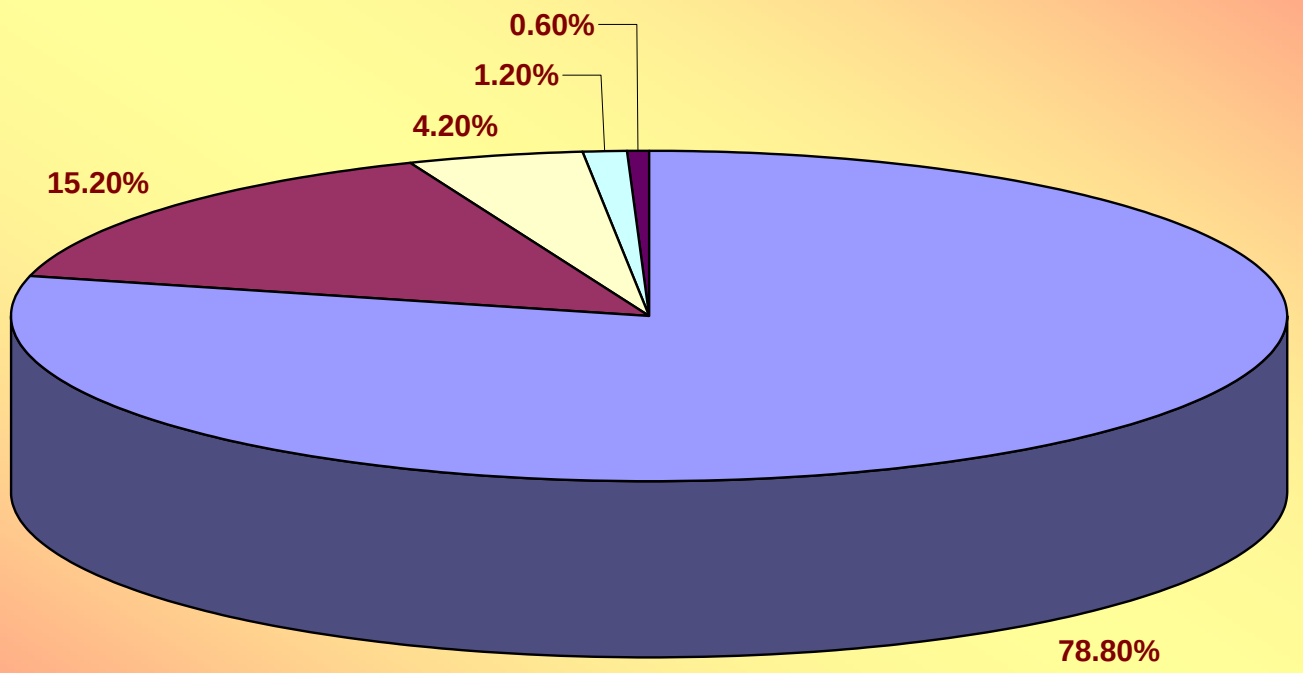
TYPES OF HERNIAS

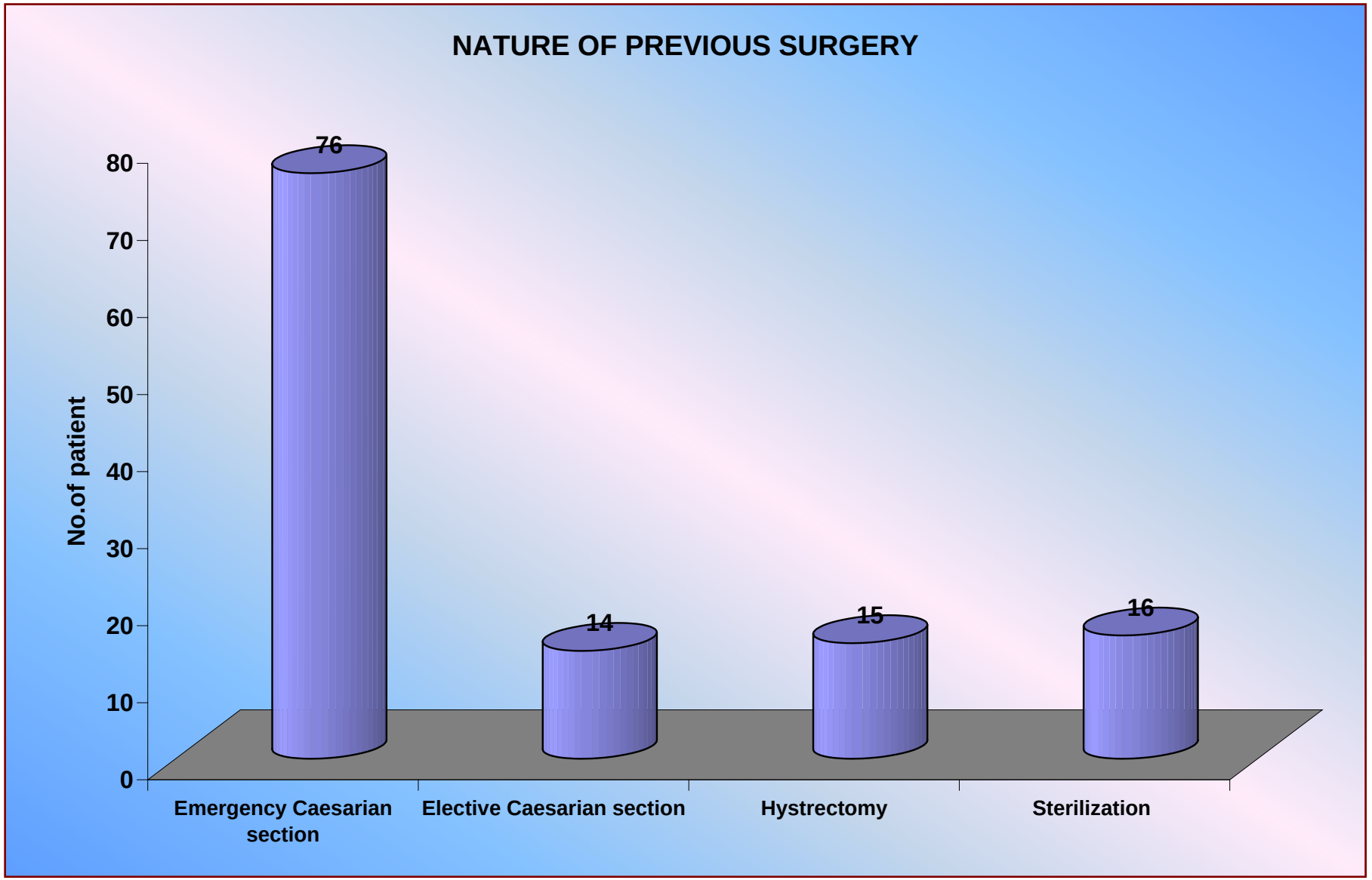



TYPES OF REPAIR
148
16
No.of patients
160
140
120
100
80
60
40
20
0
Elective
Emergency


RISK FACTORS
No.of patients
160
140
120
100
80
60
40
20
0
152
20
12
7
Obesity
Wound sepsis
Chronic cough
Abdominal distension

POST OPERATIVE COMPLICATIONS




NATURE OF PREVIOUS SURGERY
No.of patient
0
10
20
30
40
50
60
70
80
76
14
15
16
Emergency Caesarian section
Elective Caesarian section
Hystrectomy
Sterilization

MASTER CHART

Sl.No.	Name	Age	IP No.	Diagnosis		Procedure
1.	Prabhavathy	37	17870	Incisional hernia	LSCS-Emergency	Mesh repair
2.	Saraswathy	50	19614	Incisional hernia	Hysterectomy	Anatomical repair
3.	Dhaniya	53	21050	Umbilical hernia		Mayos repair
4.	Puspha	43	22094	Incisional hernia	Peurperal sterilization	Mesh repair
5.	Tara	23	26742	Incisional hernia	LSCS-Emergency	Mesh repair
6.	Sheela	28	24506	Incisional hernia	LSCS-Emergency	Mesh repair
7.	Chandrabai	70	29236	Incisional hernia	Hysterectomy	Mesh repair
8.	Mumtaz	35	31037	Incisional hernia	LSCS-Emergency	Anatomical repair
9.	Bhavani	28	32301	Incisional hernia	LSCS-Emergency	Anatomical repair
10.	Kannammal	63	32306	Paraumbilical hernia		Mayo's repair
11.	Palaniammal	60	35744	Paraumbilical hernia		Mayo's repair
12.	Brinda	31	285	Incisional hernia	LSCS-Emergency	Anatomical repair
13.	Baby	67	33423	Rt inguinal hernia		Modified Bassini's repair
14.	Usha	28	33425	Lt inguinal hernia		Modified Bassini's repair
15.	Jayashree	48	2021	Incisional hernia	LSCS-Emergency	Mesh repair
16.	Periammal	20	3878	Incisional hernia	LSCS-Emergency	Anatomical repair
17.	Rodriguez	47	257396	Paraumbilical hernia		Mesh repair
18.	Kanniammal	50	6497	Incision hernia	Hysterectomy	Mesh repair
19.	Fathima	35	7447	Incisional hernia	LSCS-Emergency	Anatomical repair
20.	Vijaya	40	10949	Incisional hernia	LSCS-Emergency	Anatomical repair

21.	Pushpakumari	40	10456	Incisional hernia	LSCS-Emergency	Anatomical repair
22.	Jeyanthi	40	10784	Incisional hernia	Peurperal sterilization	Mesh repair
23.	Prema	40	13503	Incisional hernia	Peurperal sterilization	Mesh repair
24.	Tameem	30	15214	Incisional hernia	LSCS-Emergency	Mesh repair
25.	Annammal	35	15543	Incisional hernia	LSCS-Emergency	Mesh repair
26.	Amala	32	18704	Incisional hernia	LSCS-Emergency	Mesh repair
27.	Nirmala	38	19020	Incisional hernia	LSCS-Elective	Mesh repair
28.	Joyce mary	47	21046	Incisional hernia	Peurperal sterilization	Mesh repair
29.	Saraswathy	45	22973	Epigastric hernia		Anatomical repair
30.	Shanthi	27	210231	Incisional hernia	LSCS-Elective	Anatomical repair
31.	Vasanthi	30	23816	Paraumbilical hernia		Mayo's repair
32.	Ranganayaki	82	23812	Paraumbilical hernia		Mayo's repair
33.	Rajeswari	35	24897	Incisional hernia	LSCS-Elective	Mesh repair
34.	Therasa	25	2608855	Incisional hernia	Peurperal sterilization	Anatomical repair
35.	Sakuntala	45	24893	Incisional hernia	LSCS-Elective	Anatomical repair
36.	Indrani	50	33450	Epigastric hernia		Mesh repair
37.	Muniammal	31	30891	Paraumbilical hernia		Anatomical repair
38.	Subbulakshmi	59	32952	Incisional hernia	LSCS-Elective	Mesh repair
39.	Seetha	45	29846	Incisional hernia	LSCS-Elective	Anatomical repair
40.	Meena	42	28560	Incisional hernia	Peurperal sterilization	Anatomical repair
41.	Pushpa	25	27869	Incisional hernia	LSCS-Elective	Anatomical repair
42.	Kala	23	2782	Incisional hernia	LSCS-Elective	Anatomical repair
43.	Padma	27	26885	Incisional hernia	Peurperal sterilization	Anatomical repair
44.	Indumathi	27	2608	Incisional hernia	Peurperal sterilization	Anatomical repair
45.	Lakshmi	45	26069	Incisional hernia	Peurperal sterilization	Mesh repair

46.	Radha	40	1289	Incisional hernia	LSCS-Elective	Anatomical repair
47.	Mohanalakshmi	29	1611	Incisional hernia	LSCS-Elective	Anatomical repair
48.	Chitra	28	2189	Incisional hernia	LSCS-Elective	Anatomical repair
49.	Vijayakumari	34	2484	Incisional hernia	LSCS-Elective	Anatomical repair
50.	Vijaya	37	3125	Incisional hernia	LSCS-Elective	Anatomical repair
51.	Nachammal	28	4736	Incisional hernia	LSCS-Elective	Anatomical repair
52.	Poongodi	26	6024	Incisional hernia	LSCS-Elective	Anatomical repair
53.	Alamelu	27	7403	Incisional hernia	LSCS-Elective	Anatomical repair
54.	Rakhi	29	10677	Incisional hernia	LSCS-Elective	Anatomical repair
55.	Nagavalli	50	12350	Incisional hernia	LSCS-Elective	Anatomical repair
56.	Uma	28	12305	Incisional hernia	LSCS-Elective	Anatomical repair
57.	Laxmi	29	12748	Incisional hernia	LSCS-Elective	Anatomical repair
58.	Chandra	30	14049	Paraumbilical hernia		Mayo's repair
59.	Lakshmi	40	143945	Incisional hernia	Peurperal sterilization	Anatomical repair
60.	Chandra	3	15108	Incisional hernia	LSCS-Elective	Anatomical repair
61.	Jyothika	37	15684	Incisional hernia	Peurperal sterilization	Anatomical repair
62	Jothi	27	17512	Incisional hernia	LSCS-Elective	Anatomical repair
63	Latha	21	17501	Incisional hernia	LSCS-Elective	Anatomical repair
64	Rajeswari	40	18934	Incisional hernia	LSCS-Elective	Anatomical repair
65	Rajeveni	45	19636	Incisional hernia	Peurperal sterilization	Anatomical repair
66	Saraja	60	22517	Incisional hernia	Hysterectomy	Anatomical repair
67	Pandra	45	234424	Incisional hernia	LSCS-Elective	Anatomical repair
68	Shanthi	33	30414	Incisional hernia	LSCS-Elective	Anatomical repair
69	Kamala	47	29155	Incisional hernia	LSCS-Elective	Anatomical repair
70	Komalavelli	46	2527	Para Umbilical hernia		Mayo's repair

71	Kamala	55	6590	Incisional hernia	LSCS-Elective	Anatomical repair
72	Kasturi	27	6591	Incisional hernia	LSCS-Elective	Anatomical repair
73	Meenatchi	45	6620	Incisional hernia	LSCS-Elective	Anatomical repair
74	Josephine	34	8252	Incisional hernia	LSCS-Elective	Anatomical repair
75	Meena	45	8844	Incisional hernia	Peurperal sterilization	Anatomical repair
76	Meena	43	9241	Incisional hernia	Peurperal sterilization	Mesh repair
77	Shanthi	36	70564	Incisional hernia	LSCS-Elective	Anatomical repair
78	Muthu	40	11191	Epigastric hernia		Anatomical repair
79	Dillibai	30	11210	Incisional hernia	LSCS-Elective	Anatomical repair
80	Susheela	30	11891	Incisional hernia	LSCS-Elective	Anatomical repair
81	Baby Rani	54	11966	Incisional hernia	Hysterectomy	Anatomical repair
82	Mohanalakshmi	23	13947	Incisional hernia	LSCS-Elective	Anatomical repair
83	Bala	40	13967	Incisional hernia	LSCS-Elective	Mesh repair
84	Lakshmi	28		Incisional hernia	LSCS-Elective	Anatomical repair
85	Rani	48	15330	Epigastric hernia		Anatomical repair
86	Thangam	45	16693	Epigastric hernia		Anatomical repair
87	Chitra	43	18779	Epigastric hernia		Anatomical repair
88	Varalakshmi	25	18832	Epigastric hernia		Anatomical repair
89	Devaki	46	19109	Epigastric hernia		Anatomical repair
90	Devaki	55	20946	Epigastric hernia		Anatomical repair
91	Dhanalakshmi	23	21276	Epigastric hernia		Anatomical repair
92	Rajeswari	50	21657	Epigastric hernia		Anatomical repair
93	Meena	30	21298	Incisional hernia	LSCS-Elective	Mesh repair
94	Anandhi	37	22702	Incisional hernia	LSCS-Elective	Anatomical repair
95	Valarmathy	40	23054	Incisional hernia	LSCS-Elective	Anatomical repair

96	Rani	58	24380	Paraumbilical hernia		Anatomical repair
97	Alamelu	56	25798	Incisional hernia	Hysterectomy	Anatomical repair
98	Maragatham	35	34377	Incisional hernia	LSCS-Elective	Anatomical repair
99	Sakuntala	55	23822	Epigastric hernia		Anatomical repair
100	Sudhammal	45	29599	Paraumbilical hernia		Anatomical repair
101	Akalya	44	556	Incisional hernia	LSCS-Elective	Mesh repair
102	Vasuki	48	1785	Incisional hernia	LSCS-Elective	Anatomical repair
103	Rani	45	24242	Incisional hernia	LSCS-Elective	Mesh repair
104	Ayesha	40	4501	Paraumbilical hernia		Mayo's repair
105	Indrani	35	4851	Lt inguinal hernia		Modified B assini's repair
106	Khathida	40	7722	Incisional hernia	LSCS-Elective	Mesh repair
107	Annakili	28	8124	Incisional hernia	LSCS-Elective	Anatomical repair
108	Valli	35	11052	Paraumbilical hernia		Mayo's repair
109	Malliga	35	1055	Epigastric hernia		Anatomical repair
110	Lakshmi	35	4730	Femoral hernia		Mc Evedy's repair
111	Kalaivani	50	4605	Incisional hernia	LSCS-Elective	Mayo's repair
112	Jothi	32	7432	Incisional hernia	LSCS-Elective	Mesh repair
113	Kalavathy	30	8225	Incisional hernia	LSCS-Elective	Mesh repair
114	Manjula	30	9053	Incisional hernia	LSCS-Elective	Mesh repair
115	Revathy	33	9776	Incisional hernia	LSCS-Elective	Mesh repair
116	Valli	50	113684	Para umbilical hernia		Mayo's repair
117	Savithri	47	1125	Incisional hernia	Peurperal sterilization	Mesh repair
118	Varadhamal	50	214752	Incisional hernia	LSCS-Elective	Mesh repair
119	Sethamarai	40	18236	Incisional hernia	LSCS-Elective	Anatomical repair
120	Rambai	40	17102	Incisional hernia	LSCS-Elective	Mesh repair

121	Sushila	50	16558	Paraumbilical hernia		Mayo's repair
122	Vasantha	43	16537	Incisional hernia	LSCS-Elective	Mesh repair
123	Nagamani	59	15794	Paraumbilical hernia		Mayo's repair
124	Sarala	21	11467	Incisional hernia	LSCS-Elective	Mesh repair
125	Malliga	25	13587	Incisional hernia	LSCS-Elective	Anatomical repair
126	Ayyamal	20	12827	Incisional hernia	LSCS-Elective	Anatomical repair
127	Rambala	42	11706	Incisional hernia	Peurperal sterilization	Anatomical repair
128	Mumtaz	30	9507	Incisional hernia	LSCS-Elective	Anatomical repair
129	Sakunthala	26	6109	Incisional hernia	LSCS-Elective	Mesh repair
130	Muthammal	55	3302	Incisional hernia	LSCS-Elective	Mesh repair
131	Pushpa	23	5727	Incisional hernia	LSCS-Elective	Anatomical repair
132	Periyanayaki	60	4350	Obstructed Para umbilical hernia		Anatomical repair
133	Rani	30	2174	Incisional hernia	LSCS-Elective	Anatomical repair
134	Kumuthavalli	46	2327	Para umbilical hernia		Mayos' repair
135	Indrani	30	33490	Incisional hernia	LSCS-Elective	Mesh repair
136	Subbulakshmi	59	32952	Para umbilical hernia		Mayos' repair
137	Muniyammal	31	30891	Epigastric hernia		Anatomical repair
138	Seetha	45	29846	Incisional hernia	LSCS-Elective	Anatomical repair
139	Meena	42	28560	Incisional hernia	LSCS-Elective	Anatomical repair
140	Indirani	50	12956	Incisional hernia	Hysterectomy	Anatomical repair
141	Prema	52	2165	Obstructed incisional hernia	Hysterectomy	Anatomical repair
142	Rajathi	60	26091	Obstructed incisional hernia	Hysterectomy	Anatomical repair
143	Pankajammal	75	28079	Obstructed Para umbilical hernia		Anatomical repair
144	Pankajammal	40	35798	Obstructed incisional hernia	Hysterectomy	Anatomical repair

145	Jeeva	33	5768	Obstructed incisional hernia	Hysterectomy	Anatomical repair
146	Umayal	42	7536	Obstructed incisional hernia	Hysterectomy	Anatomical repair
147	Sakkubai	65	4745	Obstructed incisional hernia	Hysterectomy	Anatomical repair
148	Ramayee	65	5743	Obstructed incisional hernia	LSCS-Elective	Anatomical repair
149	Rukmani	75	1998	Obstructed Left inguinal hernia		Modified Bassini's repair
150	Unnamalai	70	3144	Obstructed incisional hernia	LSCS-Elective	Anatomical repair
151	Gunavathy	54	2341	Obstructed incisional hernia	Hysterectomy	Anatomical repair
152	Kamala	62	21573	Obstructed incisional hernia	Hysterectomy	Anatomical repair
153	Neomisha	49	5234	Obstructed incisional hernia	LSCS-Elective	Anatomical repair
154	Meenakumari	45	17534	Incisional hernia	LSCS-Elective	Anatomical repair
155	Gowri	28	17927	Incisional hernia	LSCS-Elective	Anatomical repair
156	Megala	33	16749	Incisional hernia	LSCS-Elective	Anatomical repair
157	Maragatham	34	15888	Incisional hernia	LSCS-Elective	Mesh repair
158	Vasanthi	35	14619	Incisional hernia	LSCS-Elective	Anatomical repair
159	Kalavathy	46	14146	Incisional hernia	LSCS-Elective	Mesh repair
160	Anitha	35	14112	Umbilical hernia		Mayo's repair
161	Savithri	54	14652	Obstructed femoral hernia (R)		Mc Evedy's repair
162	Dharshini	25	14654	Incisional hernia -burst abdomen	LSCS-Elective	Anatomical repair
163	Angammmal	48	24654	femoral hernia (R)		Mc Evedy's repair
164	Stella	40	23564	Paraumbilical hernia		Mayo's repair